REMARKS

Claims 1-18 are pending in the present application. Claims 1 and 16 are amended above. No new matter is added by the claim amendments. Entry is respectfully requested.

Claims 1-18 are rejected under 35 U.S.C. 112, first paragraph. The limitation of "before forming the second electrode and without curing the second dielectric layer after forming the second electrode" as stated in claim 1 is deleted above. The limitation of "before forming the second electrode and without curing the second Ta_2O_5 layer after forming the second electrode" as stated in claim 16 is deleted above. It is believed that the claims are amended in such a manner as to address and overcome the rejection. Reconsideration of the rejection and allowance of the claims are therefore respectfully requested.

Claims 1-12 and 14-18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Chung, *et al.* (U.S. Patent Number 6,884,675) in view of Basceri, *et al.* (US Patent Number 6,673,669). Claim 13 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Chung, *et al.* in view of Basceri, *et al.* and further in view of Narwankar, *et al.* (US Patent Number 6,677,254). Reconsideration of the rejection and allowance of the claims are respectfully requested.

In the present invention as claimed in independent claim 1, a method of manufacturing a capacitor of a semiconductor device includes depositing a first dielectric layer on a first electrode, curing the first dielectric layer, depositing a second dielectric layer on the cured first dielectric layer using only a source gas without a reactant gas, and forming a second electrode on the second dielectric layer without curing the second dielectric layer.

In the present invention as claimed in independent claim 16, a method of manufacturing a capacitor of a semiconductor device includes depositing a first Ta_2O_5 layer on a first electrode, curing the first Ta_2O_5 layer, depositing a second Ta_2O_5 layer on the cured first Ta_2O_5 layer using

only $Ta(OC_2H_5)_5$ without a reactant gas, and forming a second electrode on the second Ta_2O_5 layer without curing the second Ta_2O_5 layer.

In Chung, *et al.*, a tantalum oxide layer 120 is formed when an ozone gas reacts with tantalum precursors physically adsorbed on the surface of the lower electrode (see Chung, *et al.*, column 5, lines 32-33). In Chung, *et al.*, each deposition cycle of an atomic layer deposition process embodiment of each sub-layer of a tantalum oxide layer 120 involves four steps: (1) the inflow of tantalum precursors, then (2) the inflow of purge gas, then (3) the inflow of ozone gas, and then (4) the inflow of purge gas which is carried out repeatedly to form the tantalum oxide layer 120 having a desired thickness (see Chung, *et al.*, column 5, lines 29-38). Each cycle of tantalum precursors and ozone gas provides a sub-layer of the tantalum oxide dielectric layer. The stated Chung, *et al.* cyclical deposition is similar to the conventional cyclical deposition procedure discussed in the specification at page 7, line 30 through page 8, lines 1-6, in which,

> ...depositing a thin oxide layer using ALD comprises supplying a source gas to a deposition chamber and physically and chemically adsorbing the source gas on a semiconductor substrate. Then, the redundant source gas and the physisorbed source gas are purged using a purge gas such as N_2. Next, a reactant gas such as O_2, H_2O, H_2O_2, and N_2O is supplied to the deposition chamber and reacts with the chemisorbed source gas. The redundant reactant gas is also purged using a purge gas. The foregoing steps are repeatedly performed until the thin oxide layer having a predetermined thickness is obtained.

By analogy, Chung, *et al.* utilizes a <u>source gas</u> in the form of tantalum precursors, <u>and</u> a <u>reactant gas</u> in the form of ozone O_3, to form the resulting tantalum oxide dielectric layer 120. Each sub-layer of the Chung, *et al.* tantalum oxide dielectric layer 120 is not complete until the ozone gas reacts with the applied tantalum precursors.

In contrast, in the present invention of independent claim 1, a second dielectric layer is deposited on the cured first dielectric layer using only a source gas and <u>without a reactant gas</u>, and, in the present invention of independent claim 16, a second Ta_2O_5 layer is deposited on the

cured first Ta_2O_5 layer using only $Ta(OC_2H_5)_5$ without a reactant gas. This is discussed in the specification at least at page 8, lines 7-29.

Chung, *et al.* fails to teach or suggest "depositing a second dielectric layer on the cured first dielectric layer using only a source gas without a reactant gas", as claimed in claim 1. Instead, in Chung, *et al.*, the ozone gas reacts with the adsorbed tantalum precursors to form the tantalum oxide layer, and thus the ozone gas operates as a reactant gas in the Chung, *et al.* process to form the Chung, *et al.* dielectric sub-layer. Chung, *et al.* also fails to teach or suggest "depositing a second Ta_2O_5 layer on the cured first Ta_2O_5 layer using only $Ta(OC_2H_5)_5$ without a reactant gas", as claimed in claim 16. Instead, in Chung, *et al.*, the ozone gas reacts with the adsorbed tantalum precursors to from the tantalum oxide layer, and thus the ozone gas operates as a reactant gas in the Chung, *et al.* process to form the Chung, *et al.* dielectric sub-layer.

Basceri, *et al.* is cited in the Office Action as teaching curing a dielectric layer prior to forming a second electrode, or as an alternate embodiment, depositing the second electrode on an uncured dielectric by depositing the electrode with an oxygen atmosphere or diffusing oxygen through the second electrode after deposition. Basceri, *et al.* fails to teach or suggest "depositing a second dielectric layer on the cured first dielectric layer using only a source gas without a reactant gas", as claimed in claim 1. Basceri, *et al.* further fails to teach or suggest "depositing a second Ta_2O_5 layer on the cured first Ta_2O_5 layer using only $Ta(OC_2H_5)_5$ without a reactant gas", as claimed in claim 16.

Neither Chung, *et al.* nor Basceri, *et al.* teaches or suggests "depositing a second dielectric layer on the cured first dielectric layer using only a source gas without a reactant gas", as claimed in claim 1. Further, neither Chung, *et al.* nor Basceri, *et al.* teaches or suggests "depositing a second Ta_2O_5 layer on the cured first Ta_2O_5 layer using only $Ta(OC_2H_5)_5$ without a reactant gas", as claimed in claim 16. Accordingly, it is submitted that the combination of Chung, *et al.* and Basceri, *et al.* fails to teach or suggest the invention as claimed in claims 1 and 16. Reconsideration of the rejection of, and allowance of, claims 1 and 16 are respectfully

requested. With regard to the dependent claims 2-15, 17 and 18, it follows that these claims should inherit the allowability of the independent claims from which they depend.

With regard to the rejection of claim 13, Narwankar, *et al.* is cited in the Office Action as disclosing forming an oxygen atmosphere by supplying gas in a thermal heated operation or in an RF plasma. Like Chung, *et al.* and Basceri, *et al.*, Narwankar, *et al.* fails to teach or suggest "depositing a second dielectric layer on the cured first dielectric layer using only a source gas without a reactant gas", as claimed in claim 1. Accordingly, it is submitted that the combination of Chung, *et al.*, Basceri, *et al.* and Narwankar, *et al.* fails to teach or suggest the invention as claimed in claim 1. Reconsideration of the rejection of, and allowance of, claim 13 which is dependent from claim 1 are respectfully requested.

Closing Remarks

It is submitted that all claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Respectfully submitted,

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